Space Weather Forecast

Issued on Saturday, 22 July 2023 at 13:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Chance of Minor/Moderate blackouts throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate, with one moderate flare observed from a moderately sized but relatively simple bipolar region on the on the northwest disc. There are currently six sunspot regions visible, and no notable development has been observed. The largest region is also located in the northwest, but has remained relatively inactive. Two of the other regions, one in the northeast and another in the southeast are also moderately sized but both relatively simple and have remained relatively inactive.

The Moderate flare appears to have produced a CME (coronal mass ejection) off the west disc. This remains under analysis, however this is most likely to be missing, or perhaps glancing later towards the end of the forecast period. No other Earth-directed CMEs were observed.

Solar Wind / Geomagnetic Activity: A glancing CME arrival occurred at 21/1927 UTC, with the initially background speeds of around 380km/s jumping slightly to just over 400km/s. Speed then erratically varied at slightly elevated levels of between 390-450km/s, but with a rising trend by the end of the period, This was likely the arrival of the fast wind from a small coronal hole. Interplanetary magnetic field (IMF) rose from weak to be moderate values between 21/1927-22/0140 UTC, but then became weak again thereafter. The north-south component, was generally weak and variable but briefly became moderately positive, peaking at 21/2020 UTC, before rotating to be moderately south at 21/2223 UTC. This then eased back to be mainly weak from 21/2330 UTC. Geomagnetic activity was Quiet to Unsettled (Kp 1-3), with an Active (Kp 4) interval between 21/2100-2400 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has now eased to background levels after the enhancement on 18 Jul. No radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be Low with a chance of an isolated Moderate class flare.

Solar Wind / Geomagnetic Activity: CME from the Moderate flare early 22 Jul is still under analysis, however this is likely to either miss or give just glancing impacts later in the period. Otherwise current fast winds are expected to only gradually ease day 2 (23 Jul) before a further enhancement later day 2 or more likely day 3 (22-23 Jul). Mainly Quiet to Unsettled geomagnetic activity expected throughout, with a slight chance of Active intervals day 1 (22 Jul) and rising to Active with a slight chance of isolated G1 Minor Storms with any enhancement day 2 or more likely on day 3 (23-24 Jul).

Energetic Particles / Solar Radiation: The count rate of energetic particles is expected to remain at background with only a very slight chance of rising. Radiation storms are currently not expected.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.

Met Office

Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	5	20	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.